Learning Technologies Project Bulletin

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News from NASA

1999 LTP Conference Held at Kennedy Space Center

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The 1999 Learning Technologies Project (LTP) Conference was held at The Astronauts Memorial Foundation Center for Space Education at the Kennedy Space Center from May 10 through 13. Approximately 40 individuals attended, representing all 10 NASA LTP groups and Education Offices at most centers.

The session opened with remarks by Tom Dyson, Learning Technologies Deputy Project Coordinator, and Shelley Canright, NASA Headquarters Division Liaison to LTP. Danilo M. Baylen, Instructional Designer, Division of Instructional Technology at Florida Gulf Coast University in Fort Myers was the first speaker. His topic was *Conversations within Conversations On-Line: Design, Development, and Evaluation of Interactive Activities*. His talk set the tone for the rest of the conference, pointing out some of the challenges to creating online programs. The afternoon session featured two discussion periods, one on LTP and Education Offices working together at the Center level and one on common problems.

Day two of the conference began with a presentation by Dr. Donna Price Henry, Associate Dean and Associate Professor of Biology, College of Arts and Sciences of Florida Gulf Coast University, titled *The State of the Art in Educational Technology: What Do We Know?* This was followed by time for people to visit one another's projects and exchange ideas at stations set up in a computer lab. Marianne McCarthy, DFRC Pre-College Officer and DFRC Learning Technologies Project Manager, and Barbara Grabowski, Associate Professor at Pennsylvania State University, then presented preliminary findings of their research on teacher use of the World Wide Web in the classroom. The day ended with a discussion on future plans for individual Centers and LTP as a whole.

Visits to the stations in the computer lab led off the third day of the conference. Sharon Lea, science teacher at an East Naples, Florida, middle school, gave the morning's presentation from the perspective of an educator in the field integrating online projects into the science classroom.

During the luncheon, at which time the LTP Advisory Board joined the conference, James L. Jennings, Deputy Director for Business Operations at Kennedy Space Center, addressed the group and welcomed them to KSC. Shelley Canright started the afternoon session with a presentation and an important discussion on NASA's Implementation Plan for Education. Her presentation was followed by a working session in which customers were contacted and their feedback was presented to the group via teleconference. LTP Advisory Board visits to the stations in the computer lab closed the session. That evening, a dinner was held at the Ramada Inn.

The fourth day of the conference began with members of the Advisory Board visiting the stations in the computer lab. Following the demonstrations, Kathleen Fulton, Associate Director, Center for Learning and Technology at the College of Education of the University of Maryland at College Park and an LTP Advisory Board member, gave a presentation and led a discussion entitled *Teacher Use of Technology Over Time: Supporting Change*. After lunch, Mark León, Learning Technologies Project Manager, opened the working session and wrap-up dialogue with the Advisory Board, which yielded a number of ideas for LT projects and management to consider.

At the conclusion of the formal session, several conference attendees participated in a VIP tour of KSC, which was arranged through the hosts for the conference: Gregg Buckingham, KSC University Programs Manager; Brandt Secosh, Space Team Online/Virtual Science Mentor Program; and Jane Hodges, KSC University Programs Specialist. Among the sites visited by the group were the Space Station Processing Facility, Orbiter Processing Facilities, the Vehicle Assembly Building, the Launch Control Center, and the Apollo/Saturn V Visitor Complex. The highlight of the tour was being on Launch Pad A where the space shuttle Discovery was located.

Mark León announced in the concluding session that the next LTP Conference would be held at the Jet Propulsion Laboratory in the spring of 2000. Most attendees indicated that the time visiting one another's projects at this year's conference was extremely valuable, so next year's conference will offer similar benefits. There are also plans for professional development and hopefully some overlapping time with the Educator Resource Center Network Conference, which will be held at the same time at JPL. The tentative dates for next year's conference are March 14-16.

Thanks to everyone who participated in this year's conference and made it such a success.

News Bytes

Digital Audio Testbed Will Allow Web Sites to Transmit Audio and Video

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For the past 18 months, several LTP and other NASA-affiliated Web sites, including those at ARC, JSC, LaRC, LeRC (Glenn), KSC, COTF, STScI, and GSFC, have been experimenting with Internet transmission of audio and video. This network has from time to time been linked to other commercial and government agency networks, and may soon be extended to include servers at Marshall and NASA headquarters.

The current configuration uses RealServer 5.0 from Progressive Networks. A license will be obtained shortly to support 1,700 simultaneous users across nine servers. Servers are usually Unix boxes (Sparc 20 or better), but SGI and DEC Alpha boxes have been used with equal success. The encoders are usually high-powered Pentium NT platforms. Encoders exist at ARC, KSC, COTF, GSFC, and STScI. A number of network topologies are used to route live events to the network, including Ethernet, ISDN, POTS, and the portable Internet developed at LeRC.

Multiple bandwidths are possible, and NASA Select is typically broadcast at 14.4Kb (audio only), 28.8Kb, 56Kb, and 200Kb on a 24-by-7 basis. The user requirement is a Web-capable browser with the Real plug-in or standalone player. The size and format of the video can also be changed to suit the application. For example, it is possible to "push" HTML pages in sync with an audio or video clip, or to "stream" a narrated PowerPoint slide show.

While each server is capable of supporting both canned (video on demand, or VDO) and live broadcasts, the biggest impact seems to be made by live broadcasts. Two recent events highlight this. Nearly 1,000 viewers participated in the STS-96 launch broadcast, and over 150 participants were present for the Webcast of a mental health conference. Live shows have also been done with NOAA, the Coast Guard, the National Park Service, and the Office of the President.

Almost any live event can be made into an Internet live event. Take a look at the Learning Technologies Channel (LTC) schedule page at **http://quest.arc.nasa.gov/ltc/schedule.html**. If you have ideas for an event, please contact the LTC. There is not yet a fixed cost for special services, so fees must be negotiated.

The technology continues to improve, and greater flexibility in media types is about six months down the road. This will allow a true multimedia window for streaming combined data that could contain video, audio, interactive images, animations, scrolling text, ticker tapes, and more. Imagine the possibilities of a window that has a talking head in a corner, a 3-D spinning airplane on half the screen, and a scrolling text that explains aerodynamics concepts.

DAT5k is in transition. The *T* and the *A* will be dropped shortly, but a new name hasn't been selected yet. Multimedia Internet Broadcasting is a favorite, allowing for the initials "MIB" and the motto "Forget everything you know…about Internet broadcasting." An Operational Readiness Review (ORR) of this system will be conducted in the near future.

This summer, LTC will provide extensive coverage of the next shuttle launch, and collaboration with NOAA and the National Geographic Society will continue in the "Sustainable Seas Expeditions." The project office, in collaboration with the University of North Dakota and Western Governors University, will offer NASA Robotics On-line, an eight-week seminar series. Technology will not be limited to RealNetworks since testing of LivePicture (recently installed), Windows Media, and QuickTime 4.0 will continue.

For additional information, go to **http://topweb.arc.nasa.gov/DAT5k**, **http://quest.arc.nasa.gov/ltc**, or **http://quest.arc.nasa.gov/ltc/live**.

News from NASA (cont.)

RSPAC Granted No-Cost Extension; Available for Services Until November '99

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The Remote Sensing Public Access Center (RSPAC) has been officially granted a no-cost extension to operate until November 1999. All participants in NASA's Learning Technologies Project are asked to submit requests for RSPAC services as soon as possible to assist RSPAC in better scheduling and serving them through this extended period. To request RSPAC support, please contact Phyllis Griggs at pgriggs@rspac.ivv.nasa.gov, or any other members of the RSPAC staff.

RSPAC provides general and specific support to all of the groups affiliated with NASA's Learning Technologies Project. For more information about the support services that are available through RSPAC, please visit **http://developers.ivv.nasa.gov/rspac/index.html**.

If you would like to be on the LTP Bulletin mailing list, please send e-mail to Scott Gillespie at: sgillespie@rspac.ivv.nasa.gov, or write to: BDM/RSPAC, 100 University Drive, Fairmont, WV 26554. Phone: (304) 367-8324, fax: (304) 367-8211.

In the Spotlight

Wanted by The Inquisitor: LTP Web Sites for Beta Testing

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The Inquisitor is a program that will interrogate and analyze your Web server logs and display the results in a user-friendly HTML format. It is being designed and developed by RSPAC, both for its own use and for dissemination to other LT projects. In addition to standard graphs showing server hits, The Inquisitor features customizable results, the ability to see the path a user takes through a site (threads), and a "refer" table that shows how the user found a site. RSPAC is currently looking for LT projects to act as beta testers for The Inquisitor.

Perhaps the hardest part of being a Webmaster is coping with success. When a Web site is small and not visited often it is easy to browse the server logs and see who is accessing the site and what pages they are visiting. When you get on someone's What's Cool page, though, your whole world changes. Reading through a log file containing 100,000 hits a day and making sense out of all that data is next to impossible.

The Web production team at RSPAC has been blessed with just such a popular server. In addition to our own Web sites (NASA's Observatorium and the Developers' Workshop), we mirror a number of very popular sites. In order to make sense of the server logs, we tried to use off-the-shelf statistics packages (www-stats, wusage, etc.) but found them inadequate for analyzing our complicated Web server with its multiple mirrors and separate content areas. That's when we started to design The Inquisitor, a highly configurable Web log analysis tool. We have incorporated the standard statistical information, like hits per day and hits per page, and we have also tried to make tools that reveal more subjective information.

As an example, our "threads" tool can show how a visitor uses a site. By searching the server logs and arranging the hits by IP number, you can see the order in which an individual user hits your pages. We call this ordered listing of a user's session a "thread."

We have found the threads tool to be a valuable resource. For example, a section of the Observatorium called the Exhibit Hall had navigational buttons (Back, Exit, Next) designed to guide the user through the pages in a logical order. Using The Inquisitor, we watched as visitors completely bypassed our buttons and traversed the pages in an awkward order. We quickly realized that our navigation buttons were confusing to our users. Armed with this information, we went back to the drawing board and corrected the problem.

The Inquisitor gathers information stored by the server and compiles it in an easy-to-use HTML format. One of the most useful features of The Inquisitor is its ability to be configured to include or exclude data from its graphs and output tables.

To download a zipped version of this program, go to **http://developers. ivv.nasa.gov/tech/javainquisitor/ downloadDesc.html**. To receive a fully documented version with source code, please send e-mail to inquisitor@ rspac.ivv.nasa.gov.

> This bulletin will also be available in Adobe Acrobat format on the Developers' Workshop Web site at: **http:// developers.ivv.nasa.gov/collab/pubs/ bulletin/**

Nothin' but Net

NASA's Observatorium Will Become Handicapped-Accessible

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RSPAC plans to make one of NASA's more popular sites, NASA's Observatorium (**http://observe.ivv.nasa.gov**), accessible to individuals with visual handicaps. Currently, NASA's Observatorium is lacking several of the key characteristics that make Web sites "readable" to the blind and visually impaired. These characteristics are defined in *The WC3 Web Accessibility Guidelines*, developed by the WC3 Web accessibility initiative, an organization directed by the inventor of the World Wide Web. The organization has developed Bobby, free software that scans Web sites to determine the extent of accessibility.

By utilizing these guidelines, NASA's Observatorium can set an example. It can meet the demands of those who are asking for an equal opportunity to access information and services. Fulfilling this demand will involve several steps.

First, NASA's Observatorium must be reviewed and have its current design analyzed by Bobby. The Bobby software can be downloaded from the Internet or it can be used from the homepage at **http:// www.cast.org/bobby**. Second, the errors determined by Bobby must be fixed by editing the code at the specific locations of error. Third, it can be determined whether the suggestions to improve accessibility proposed by the Bobby software are necessary and should be implemented in NASA's Observatorium's code.

Once the entire site has been scanned and modified and no accessibility errors have been found, NASA's Observatorium may include a logo on its pages which states that it is accessible to handicapped users.

"The power of the Web is in its universality. Access by everyone, regardless of disability, is an essential aspect."
— Tim Berners-Lee, WC3 director and inventor of the World Wide Web

Nothin' but Net (cont.)

PhotoShop Reminder: Use the Right File Format and Color Mode

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In PhotoShop, it is important to use the correct file format and the correct color mode. These will vary depending on whether the graphic or image is being used for the World Wide Web or for print.

If the graphic or image is to be used on the World Wide Web, there are three graphic formats to choose from. The first is the GIF (Graphic Interchange Format). The GIF uses the Index color mode, which allows up to 256 colors using an 8-bit system. Using the GIF allows for transparency and animations. The GIF is great for small images and nice for large images with limited colors. A nice thing about a GIF is that it can be loaded as an interlaced graphic, which means that it is initially blurry, then sharpens as it loads.

Another file format that is used on the Web is the JPEG (Joint Photographic Experts Group). The JPEG uses one of two color modes: RGB (red, green, blue) or CYMK (cyan, yellow, magenta, black). The RGB color mode should be used on the Web. The JPEG is great for images that contain millions of colors because it uses a 24-bit color system, which allows it to use millions of colors. The JPEG is also great for the Web because it has a compression setting for compressing the image when it is being saved.

The newest Web file format is the PNG (Portable Network Graphic). The PNG has features of both the GIF and the JPEG. The PNG can use Index color or RGB as its color mode. The PNG allows for transparency but does not support animations. The PNG is not widely used on the Web but is allowed because of some of the new features.

When designing graphics for print, a different set of color modes and file formats should be used. Print graphics should use the CYMK color mode because it contains the colors the printer uses when printing. The file format can vary. There are several file formats to choose from when saving: TIFF (Tagged-Image File Format), PICT (Macintosh)/PCT (Windows), PCX, EPS (Encapsulated PostScript), and JPEG. The most recommended file format for printing is the EPS format because it uses the same language as the printer (PostScript).

If you're printing from PhotoShop and you get light blue where it should be white, check the color mode settings. If the color mode is set at RGB the white comes out blue. Change the color mode to CYMK to get rid of the light blue, but be careful because it darkens the image. Keep in mind that the computer screen uses RGB, not CYMK, to display the image. Some color and brightness/contrast adjustments might be needed.

Just remember to check the color mode before starting and remember to save the file in the desired format based on what the image is going to be used for.

Highlights & Happenings

ALLSTAR Web Site Has Successful Academic Year

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The ALLSTAR project, funded by a NASA CAN in 1995, has completed another successful academic year. The Web site (**http://www.allstar.fiu.edu**) was recognized for its excellence when it was named a summer 1999 CyberSurfari Outpost. ALLSTAR will be one of the sites for an educational treasure hunt on the Web site (**http://www.cybersurfari.org**). ALLSTAR also received a StudyWeb Award for its Teacher's Resource Guide. A CD-ROM containing much of the site's materials is now available to students and teachers.

Since ALLSTAR went online in June 1997, it has:

⟨ Received more than 7.49 million hits
⟨ Transferred over 82.5 GB
⟨ Tracked over 455,000 unique IP addresses
⟨ Achieved a 2.6-fold increase in the number of unique (monthly) IP addresses from July to June (1998-1999 versus 1997-1998)
⟨ Achieved a 1.84-fold increase in the number of GB transferred monthly from July to June (1998-1999 versus 1997-1998)
⟨ Achieved a 1.86-fold increase in the number of monthly hits from July to June (1998-1999 versus 1997-1998)
⟨ Achieved an 8.25-fold increase in the number of unique IP addresses during June, July, and August (1998 versus 1997)
⟨ Achieved a 5.93-fold increase in the number of GB transferred monthly during June, July, and August (1998 versus 1997)
⟨ Achieved a 6.28-fold increase in the number of hits during June, July, and August (1998 versus 1997)
⟨ Achieved a 2.48-fold increase in the number of unique IP addresses from September to May (1998-1999 versus 1997-1998)
⟨ Achieved a 1.71-fold increase in the number of GB transferred monthly from September to May (1998-1999 versus 1997-1998)
⟨ Achieved a 1.73-fold increase in the number of monthly hits from September to May (1998-1999 versus 1997-1998)

Based on the data presented, the 1998-1999 academic year was an excellent follow-up to the superior inaugural year in 1997-1998. All those at NASA who have contributed to its success deserve a special thanks.

An Update from Goddard's Earth and Space Sciences Education Project

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In FY97, a repository of 43 "investigations" for grades 5-8 and 9-12 was developed during a four-week summer workshop at Goddard Space Flight Center, converted to HTML, and put through a content validation process with MTPE scientists. In FY98, an additional 22 investigations (with accompanying abstracts) and 15 educational science briefs were developed at a follow-on summer workshop of Goddard's Earth and Space Sciences Education Project (GESSEP). Those also entered the finishing process.

In FY99, teachers will expand the repository with a new set of investigations to be developed in a July 1999 workshop. Participants in this workshop will be drawn from Maryland, Connecticut, and West Virginia. As in FY98, focus will be on developing investigations directly related to NASA Earth and space science projects, and teachers will be paired with scientists representing various NASA projects. The Science–Ambassador matches for the summer are: ACE–one team (2 teachers); Mars Mola/NEAR–one team (2 teachers); Antarctica–one team (3 teachers); Glaciers and Ice sheets–one team (2 teachers); Landsat–one team (2 teachers); Sun Earth Connection Forum–two teams (4 teachers); NASA Visualization—one team (2 teachers); Multiwavelength Milky Way–one team (2 teachers); and Education Mall–one team (2 teachers). The developed investigations will meet national science, math, geography, and technology standards, as well as the state standards of Maryland, West Virginia, and Connecticut.

Pilot testing of the FY97, FY98, and FY99 investigations will occur during the 1998-2000 school years. Classroom teachers will register to pilot individual investigations in their classrooms. For more information, go to the pilot site at **http://education.gsfc.nasa.gov/**, then click on the GESSEP logo. GESSEP strives to collect 25-30 evaluations per investigation. This feedback will be used to refine the investigations and determine the relative value of each investigation in the classroom. Dr. Gilbert Austin, former executive director of the Center for Educational Research and Development at the University of Maryland, Baltimore County, will analyze the evaluation data for validity. The number of accesses to the Web site and the geographical distribution of the accesses will also be monitored.

The Public Connection Announces Revisions to *Space Update* CD-ROM

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The Public Connection is pleased to announce revisions to the popular *Space Update* CD (the full version of the CD is now in over 1,800 schools and museums, with an additional 400 "Space Weather" CDs distributed at NSTA). The *Sky Tonight* high-resolution star and planet movies are now available for three latitudes: 30, 45, and 60 degrees. The *Space Update* CD can now be ordered for one of these latitudes. If you already have a *Space Update* CD (or if you only want to run *Sky Tonight*), you can download the skyview movies for your latitude from **ftp://earth.rice.edu/Space_Update/module_updates/Sky_tonight/.** Choose a latitude (30, 45, or 60 degrees) and get the entire "5AM" and "8PM" folders. (Note: each folder is ~60 MB and must be transferred as *binary*!)

There is a new application file and a new stand-alone module for *Sky Tonight.* These movies can be used as a stand-alone museum or school exhibit. The program uses a PC's clock to begin viewing on the current date, but the program can go backward or forward in time for a year's worth of skies.

The Mac version of the projector is called The Sky Tonight and is located at **ftp://earth.rice.edu/pub/Space_Update/module_updates/Sky_Tonight/MAC**.

The PC version is called SKYTONIT.EXE and is located at **ftp://earth.rice.edu/pub/Space_Update/module_updates/Sky_Tonight/PC/.**

Please note: If you are running *Space Update*, you should also get the skytonit.dxr file to replace the one you already have. Put the projector in the same folder as the movie folders. (If *Space Update* is already on your hard drive, put the projector in the folder which already has skytonit.dxr.) Of course, for folks with slow connections, the easiest way to get the new version of *Space Update* is to order it from us. Send e-mail to connect@space.rice.edu!

The Public Connection's Cu-SeeMe efforts were recently awarded with a "Links2Go" award. A Cu-SeeMe-accessible course, Astronomy for Teachers, will be offered this fall (Tuesday evenings, 5-8 p.m. Central time). The materials and activities will be Web-accessible and can be done at the teacher's convenience. For more information, contact Dr. Sumners at csumners@hmns.org or Dr. Reiff at reiff@rice.edu. A Web page describing the program will soon be available and accessible from the Cu-SeeMe Web site at **http://space.rice.edu/hmns/dlt/videosched.html**.
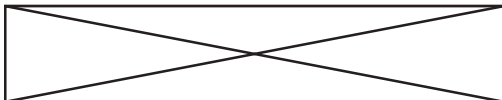
Listserves have been set up so that users of projects can get information on new developments and new products. These listserves are: video@listserv.rice.edu (for Cu-SeeMe "Ask the Scientist" events and online courses), spaceup@listserv.rice.edu (for school users of *Space Update* software), and spacemus@listserv.rice.edu (for museum users of *Space Update* software). To join, send e-mail to listserv@listserv.rice.edu with the *text* of the message as: subscribe list-name user@host firstname lastname. Replace list-name with video, spaceup, or spacemus as desired. User@host is your e-mail address and firstname lastname is your name. These listserves are moderated, so you need not fear getting junk e-mail.

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